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Indiana Gear Works Correspondence

Al Mendez

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March 2, 1965

Morgan Construction Company
15 Belmont Street
Worcester, Massachusetts

Attention: Mr. Ed Randall
Reference: P. O. H-10395

Gentlemen:

This letter is in regard to our phone conversation of 2-23-65, pertaining to spacing tolerances of cut spiral bevel gear teeth that we will soon be manufacturing for you.

We have reviewed the AGMA 390.02 specification for Class 12 Bevel Gears which allows:

- .00035 to .0004 pitch tolerance
- .0006 tooth to tooth spacing
- .0012 total index tolerance

We have also reviewed your blueprints which reference the AGMA specification with an additional requirement of .0004 tooth to tooth spacing variation.

We have taken exception to the .0004 tooth to tooth spacing tolerance on your blueprint. (Note: tooth to tooth spacing should not be confused with tooth to tooth pitch variation).

We can also appreciate your concern in wanting to control these variations so they do not accumulate over a small and consecutive number of gear teeth.

[Signature]
We would like to propose the following tolerances and method of inspection to control this condition and still give us a realistic manufacturing tolerance.

- 0.003 max. tooth to tooth pitch variation
- 0.006 max. pitch error
- 0.0015 max. accum. index error

a) Tooth to tooth pitch variation will be checked with a Gleason checker as shown in Fig. #1 and #2. Actual readings will be recorded as shown in Fig. #3, Column #1, and pitch variation will be determined as shown in Fig. #3, Column #2.

b) Maximum pitch error (0.006) will be determined from Column #3 after readings from Column #1 are corrected to zero.

c) Total index error can be determined, as shown in Column #4, by the algebraic addition of Column #3. The total index error would be equal to the difference in the minimum and maximum readings in this column. Total index error can also be determined by algebraically plotting the actual readings recorded in Column #1. (Ref. - Fig. #4).

We feel that these tolerances will give you the quality of gear that you require and trust that you will concur with the tolerances and method of inspection as specified.

We have also taken exception to the 32 micro-finish for cut gears. This finish will be approximately 63 micro.

Very truly yours,

INDIANA GEAR WORKS
A Division of
THE BUEHLER CORPORATION

Al-Mendez
Assistant Gear Superintendent

AM:e
<table>
<thead>
<tr>
<th>Zero Correction</th>
<th>Tooth to Tooth</th>
<th>Pitch Variation</th>
<th>Max Pitch Error</th>
<th>Index Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000.00 +</td>
<td>2000.00</td>
<td>0.000</td>
<td>1000.00 +</td>
<td>5000.00 +</td>
</tr>
<tr>
<td>5000.00 -</td>
<td>0.000</td>
<td>2000.00</td>
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<td>0.000</td>
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<td>1000.00 -</td>
<td>0.000</td>
</tr>
</tbody>
</table>

**Table Notes:**
- Index Error: 0.0016 Total
- MAX (Max) 0.0016 (Min)
- MIN (Min) 0.0001
- MAX (Max) 0.0006
- MIN (Min) 0.0001

**Figure #3**